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MEMORANDUM

To: Technical Advisory Council Members

From: Trevor Clements, Kimberly Brewer, and Jon Butcher

Subject: March 7, 2006 Follow Up Technical Advisory Council Conference Call Summary

A follow up conference call for the Lake Maumelle Technical Advisory Council (TAC) was convened March 7, 2006 at 10 a.m. CST, continuing the conversation begun during the 3/2/06 TAC conference call. Trevor Clements took roll call, and members were advised that the call was being taped for later review by those that could not participate. Six members participated, along with Robert Hart from the Arkansas Department of Health (see attached attendance record). Trevor Clements moderated the call, and was supported in technical discussion by Jon Butcher and Kimberly Brewer on behalf of Tetra Tech, Inc.

Continuation of Baseline Analysis Results Review

Trevor summarized the outcome of the 3/2/06 conference call, discussing the major points of the baseline analysis results and proposed lake targets. Trevor stated that in the time since the 3/2 call, Tetra Tech had taken several steps to address points brought up during the previous call. Dr. Butcher had further reviewed the wastewater and nonpoint source assumptions and prepared a response memo to the TAC. Updated tables were prepared providing a breakdown in the three watershed loading zones (upper, middle, and lower) by developable and total land area. Additionally, the loading results were displayed in terms of areal loading rates for comparison (e.g., lb/ac/yr). Tetra Tech also received additional input from CAW regarding treatment plant intake and finished water levels for TOC and turbidity, and effects on operations.

Dr. Butcher summarized his main points from the memo sent to the TAC, with attention to the TOC and BOD assumptions basis and their relative influence on the lake modeling predictions. He also mentioned that the baseline model assumptions for the nonpoint source runoff had been internally reviewed and refined to be consistent with the model development report. Overall, he indicated that the refinements would produce changes in the loading amounts and lake response, but that the major conclusions from the preliminary results would likely not change (i.e., management must address the potential threats and risks posed by future wastewater discharge, and that both point and nonpoint sources will need to be managed to control loading to levels that will meet the proposed lake targets).

Dr. Butcher then summarized the time-of-travel (TOT) baseline results, which the TAC did not have time to discuss during the 3/2 call. He explained that the primary purpose of the TOT analysis was to identify areas of greater concern for spills relative to the time it would take to reach the water supply intake (i.e., to establish relative risk). Tetra Tech's approach therefore was to assess three components: overland, in stream, and through the lake using a grid based system. The overland component reviews travel time during a relatively heavy storm (2-yr, 24-hr event). Jon noted that this could be local to a point in the watershed, since the analysis looks at travel from each grid point. Flow then moves through the stream

network joining land to the lake boundary. Travel time in-stream assumes the 95th percentile of predicted velocities for the stream (i.e., representing a storm event situation). For the lake, it was assumed that the event occurs during a period when the lake pool elevation is below the spillway (e.g., summer mild dry period) so that the spill is directed toward the water supply intake rather than being carried over the spillway and out of the lake. Directing TAC members' attention to the TOT results graphics, Jon explained that travel time for the overland component ranged up to 17 hours, but averaged only a few hours. Similarly, travel time in the streams averaged only two to three hours. However, travel in the lake ranged up to more than 30 days. Thus, for these "worst case" assumptions, time of travel in the lake portion influences the definition of risk more than the overland and stream components.

Bruno Kirsch asked whether the modeling accounted for temperature, intake depth, and potential short-circuiting. He cited recent research on the short-circuiting phenomenon observed in another southeastern reservoir. Dr. Butcher responded that the model does address temperature effects, depth variation, and other influences such as wind. Surface movement is most heavily influenced by wind. Longer travel times from more remote areas in the lake reflect effects of wind and natural circulation patterns. Tetra Tech is continuing to evaluate more localized impacts on time of travel in the lower lake zone closest to the intake.

Trevor reminded members that the lake modeling report had been posted to the special ftp website set up for the TAC, and that questions and comments were welcome. Comments were being compiled through March 15.

Munsell McPhillips asked how uncertainty would be addressed in conveying the modeling results, and whether we would be providing confidence intervals about predictions. Dr. Butcher indicated that uncertainty was an important but complex issue. He stated that the model calibration was good, providing confidence in the model predictions. However, he acknowledged that there would be unknown levels of uncertainty in the future predictions because of uncertainty in actual land use conversions that will take place and that the model was calibrated for existing conditions which are largely undeveloped. Dr. Butcher felt that uncertainty in the baseline results was not a big issue because the big picture was not likely to change for these semi-worst case scenarios. However, for the next stage of management scenario evaluation, he agreed that it will be more important to consider the uncertainty. If the technical model predictions are not significantly different, then decisions will fall to other criteria such as cost, political feasibility, etc. Jon concurred with Munsell that stakeholders will likely need this guidance regarding model prediction uncertainty.

Munsell then asked whether the buffers proposed under CAW's current management strategy had been incorporated with the model either directly or embedded in the analysis. Trevor indicated that the model assumed a very large amount of undisturbed land that constituted much more land area than the buffers alone in those subwatersheds. The watershed model lumps land by pervious and impervious categories for each hydrologic unit, such that the land in the undisturbed forest category more than covers the buffer. In fact, Tetra Tech is concerned that not enough land was assumed to be cleared in the baseline analysis such that nonpoint source impacts may have been underestimated. However, even with increases in the nonpoint source loads, point sources would continue to dominate the overall loads to the lake unless significant management measures are taken.

Members noted some additional corrections to make in the draft baseline analysis materials before finalizing them in reports or presentation materials for the Policy Advisory Council.

Preliminary Concepts for Management Scenarios

Kimberly Brewer then presented Tetra Tech's preliminary ideas for management scenarios. She began by summarizing the input received at recent public meetings from the Policy Advisory Council, watershed property owners, and Little Rock/North Little Rock communities (note: these findings are documented in the February 16 PAC meeting summary). Based on Tetra Tech's research to date and the stakeholder

input, Kimberly presented two preliminary scenario concepts: 1) a conservation/non-structural engineering approach, and 2) a performance standards approach with greater provisions for engineered best management practices (outlined in a handout sent to the TAC). The conservation/non-structural engineering scenario would focus on options such as large lot or cluster provisions, open space requirements, and other non-structural engineering options. The performance standards approach would establish loading rates and potentially hydrology control requirements that must be met by proposed development designs.

Kimberly noted that three management zones were being proposed for each scenario (Critical Area A, Critical Area B, and Upper Watershed – shown on a map sent to the TAC). She stressed that these are not the same zones as used for the baseline assessment. Those zones focused on drainages to specific parts of the lake. These proposed management zones reflect the time-of-travel modeling results and relative proximity to the water supply intake. Each scenario would have nonpoint source requirements for controlling runoff from new development, and wastewater disposal requirements (Trevor noted that Tetra Tech would be conferring with representatives from the Arkansas Department of Health and ADEQ regarding considerations for managing the wastewater). These would be defined when load allocations are developed for protecting lake targets.

Trevor and Jon described the process that Tetra Tech would be applying to develop the performance standards. Once lake targets have been approved by the PAC, Tetra Tech will use the watershed and lake models iteratively to establish load allocations for the management zones. The allocations will then be translated to performance standards for new development (i.e., areal loading rates) based on developable areas and relative risk to the intake area.

Munsell McPhillips indicated that she understood the general logic behind the approach. She stated that developers should be given the responsibility for selecting the BMPs under the performance standards approach. Kimberly responded that in many cases local oversight agencies develop a menu of acceptable practices (and sometimes a corresponding design manual) which developers can choose from in designing a particular development. The lists can incorporate new BMPs as sufficient demonstration of performance is provided.

Kimberly then went over the table sent to the PAC that provided “Nonpoint Source Relative Management Effectiveness Examples.” These were developed using Tetra Tech’s Site Evaluation Tool in response to the PAC’s request for a table showing relative effectiveness of practices that we would be asking them to consider. Kimberly emphasized that the examples in the table reflect a specific set of assumptions and are not the only options that will be considered. Additional assumptions will need to be developed and analyses performed after performance standards have been set.

Stephanie Hymel asked what was covered in the impervious surface assumptions (did it include roads, rooftops, etc.)? Kimberly replied that it covered all impervious surfaces on the individual lots (i.e., allowances for rooftops, driveways, parking pads, patios, etc.) and roads within the development.

Munsell pointed out that cluster development typically has less imperviousness than large lot configurations, and that conservation design was not the same as large lot. Kimberly acknowledged that the current version of the table only addressed certain assumptions. The current table showed how the cluster option could be used as an incentive to achieve more housing while meeting the same impervious and open space requirements. However, another example could be provided showing that equivalent density levels would likely result in less imperviousness for the cluster option. Regarding the conservation design, Kimberly noted that our assumptions for large lot open space were bordering on conservation design. However, she acknowledged that a refined example could be developed to show differences more clearly. Tetra Tech agreed to look at refining the table before sending it to PAC members to see if these additional examples could be incorporated easily.

For the Critical Area A, Kimberly mentioned that the detention-type BMPs would be required as a safety measure with emphasis on providing a means for increasing the response time for any potential spills. While the detention basins would likely have some secondary benefits at reducing pollutant loading offsite, they will not be credited in meeting the water quality performance standards (they will be kept as a safety measure). Developers will need to use conservation design and low impact development to achieve the water quality performance measures, without relying on the detention BMPs for additional credit.

Munsell asked whether the withdrawal/holding times for the detention basins would be set for 48 hrs. She felt it was important to provide as much safety/response time as practicable. Trevor indicated that design specifications had not been established yet, but that Tetra Tech was also considering the 48 hr time as the possible standard.

Stephanie asked whether the plan would include recommendations that timber companies be required to employ specific best management practices. Tetra Tech replied that the plan would address other kinds of impacts besides new development, and that for forestry the plan would recommend SFI certification (already obtained by Weyerhaeuser, and being sought by Deltic Timber) and implementation of best management practices.

Bruno asked whether the Tetra Tech team of geomorphologists had surveyed the forest areas recently cut along the northeastern portion of the watershed (subwatersheds 32 and 27). Trevor agreed to follow up with Bruno.

Munsell wanted to know whether the management requirements would stem from the baseline analysis or the lake targets. Tetra Tech indicated that the baseline analysis helps identify what needs to be managed, but that specific performance standards will be tied to the lake targets and not the baseline analysis results.

Next Steps

Trevor stated that refinements would be made to the preliminary baseline analysis results memo and other handouts for the PAC based on the input from the TAC and additional Tetra Tech research and analysis. He reminded members that the next PAC meeting was scheduled for March 16 at 5:30 p.m. CST, and that they were welcome and encouraged to attend. Copies of the PAC meeting materials will be sent to TAC members prior to the meeting. Following the meeting, Tetra Tech will be working intensely with the watershed and lake models to work through a complex iteration process to establish the load allocations and performance standards. Once initial results can be communicated effectively, Tetra Tech will send information to TAC members and set up conference calls or individual/task force meetings as appropriate.

Tetra Tech thanked the Council members for their participation, and the call was adjourned.

Technical Advisory Council Member Attendance

Meeting Date: March 7, 2006

(P indicates present; NP indicates not present)

MEMBER NAME

REPRESENTING

<u>NP</u>	Brazil, Ken	ARKANSAS NATURAL RESOURCES COMMISSION
<u>NP</u>	Cassart, Dick	ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY
<u>NP</u>	Clingenpeel, Alan	U.S. FOREST SERVICE
<u>NP</u>	Cranmer, Morris	UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES
<u>P</u>	Green, Reed	U.S. GEOLOGICAL SURVEY
<u>P</u>	Hymel, Stephanie	AUDUBON ARKANSAS
<u>P</u>	Kirsch, Bruno	CENTRAL ARKANSAS WATER
<u>NP</u>	Malone, Walter	LITTLE ROCK DEPARTMENT OF PLANNING & DEVELOPMENT
<u>P</u>	Mckenzie, Jim	METROPLAN COUNCIL OF LOCAL GOVERNMENTS
<u>P</u>	McPhillips, Munsell	DEL TIC TIMBER CORPORATION
<u>P</u>	Miller, Roger	ARKANSAS DEPARTMENT OF HEALTH
<u>NP</u>	Pope, Ashley	PULASKI COUNTY DEPARTMENT PLANNING & DEVELOPMENT
<u>NP</u>	Shannon, John	ARKANSAS FORESTRY COMMISSION
<u>NP</u>	Stapleton, Carl	UNIVERSITY OF ARKANSAS AT LITTLE ROCK, ENVIRONMENTAL HEALTH SCIENCES

Others Present

Brewer, Kimberly
Butcher, Jon
Clements, Trevor
Hart, Robert
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